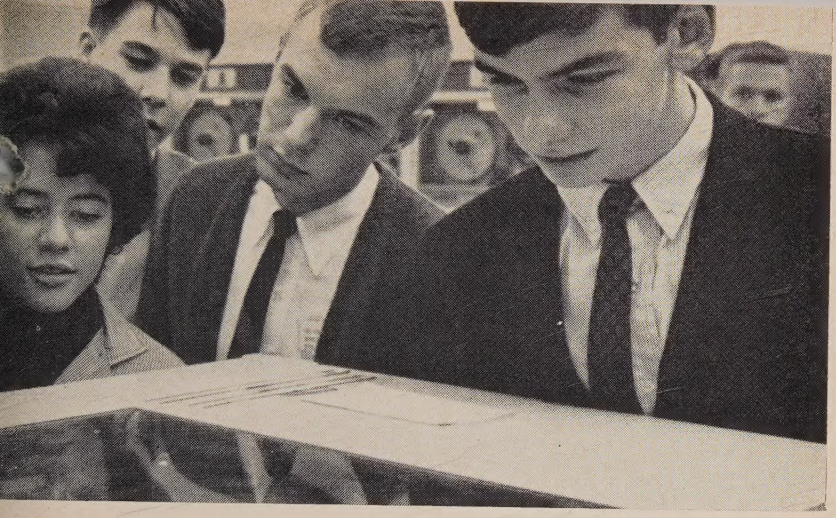
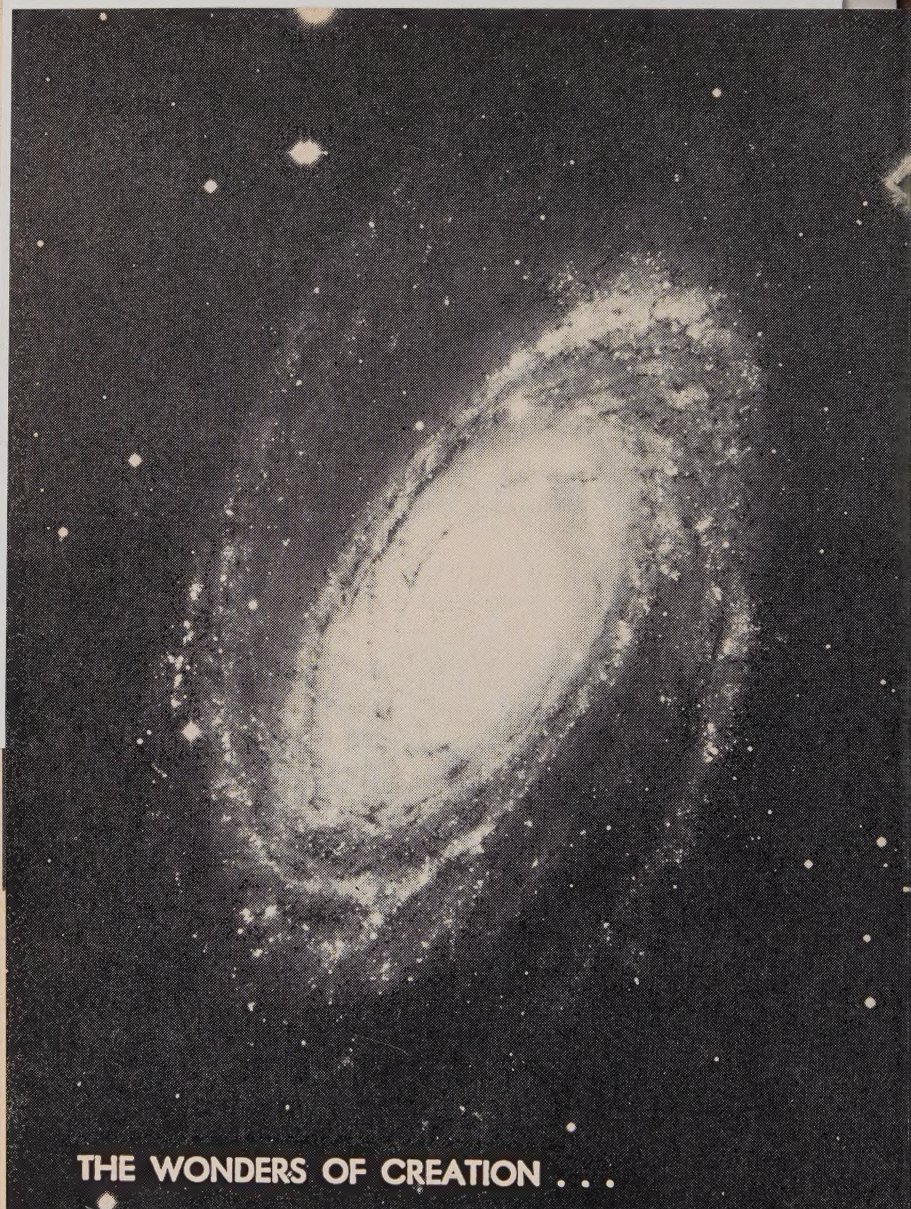
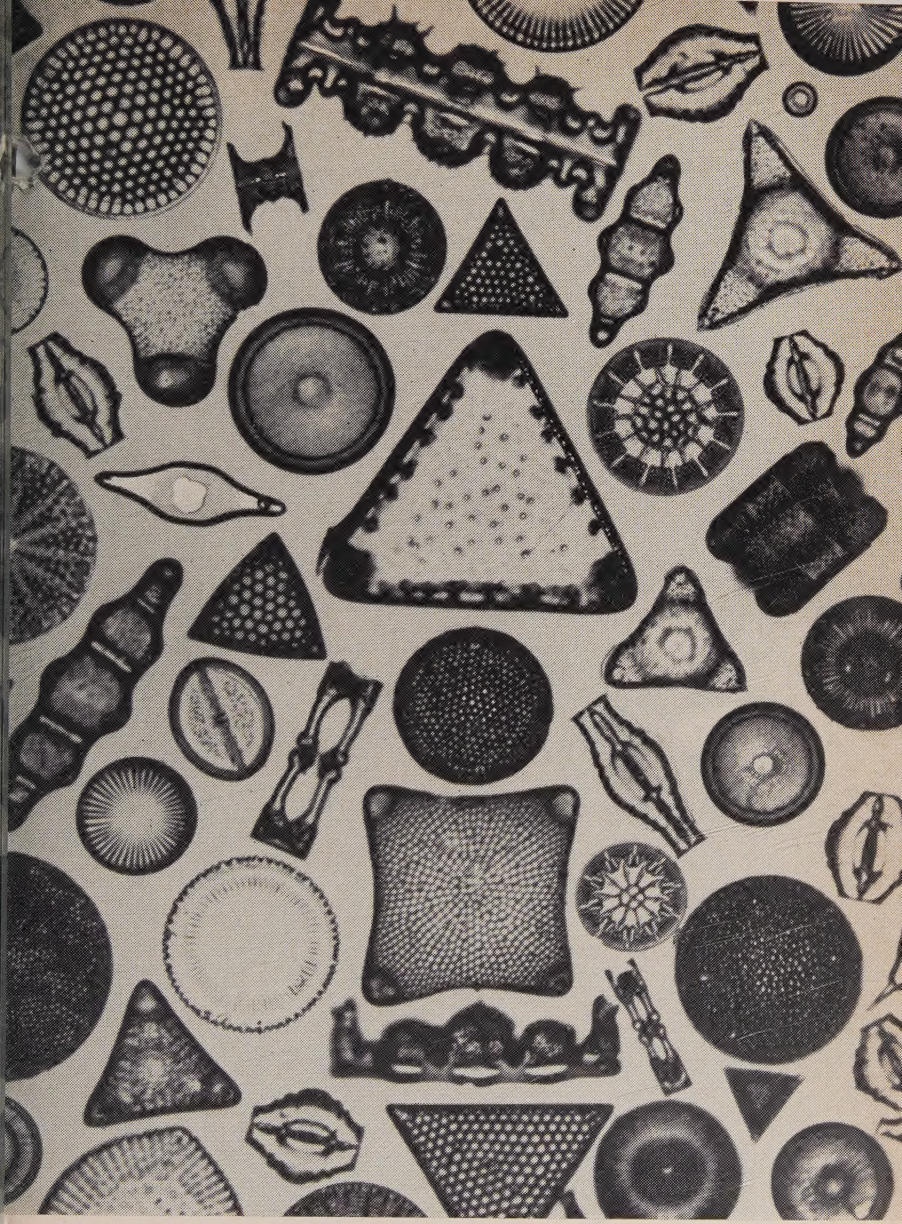


Youth / . . . MANY WORLDS HAVE I CREATED



THE WONDERS OF CREATION . . .

The solar system in which our earth revolves is a mere speck on the ed
gigantic "cosmic archipelago," known as a galaxy and similar to the spira
of the Great Bear (above). Total diameter of our galaxy is about 100,00
years (one light year is the distance traveled by light in one year—or abo
billion miles). Many galaxies exist in this vast universe.



together with certain other microscopic forms, constitute the main
e of the oceans and thus a source of food for fish. Oil produced by dia-
rich in vitamins, accumulates in fish livers, becoming a source of commercial
ns. When seen under a microscope, the exquisite sculpturings of diatoms
claimed among the most beautiful objects in nature.

Youth

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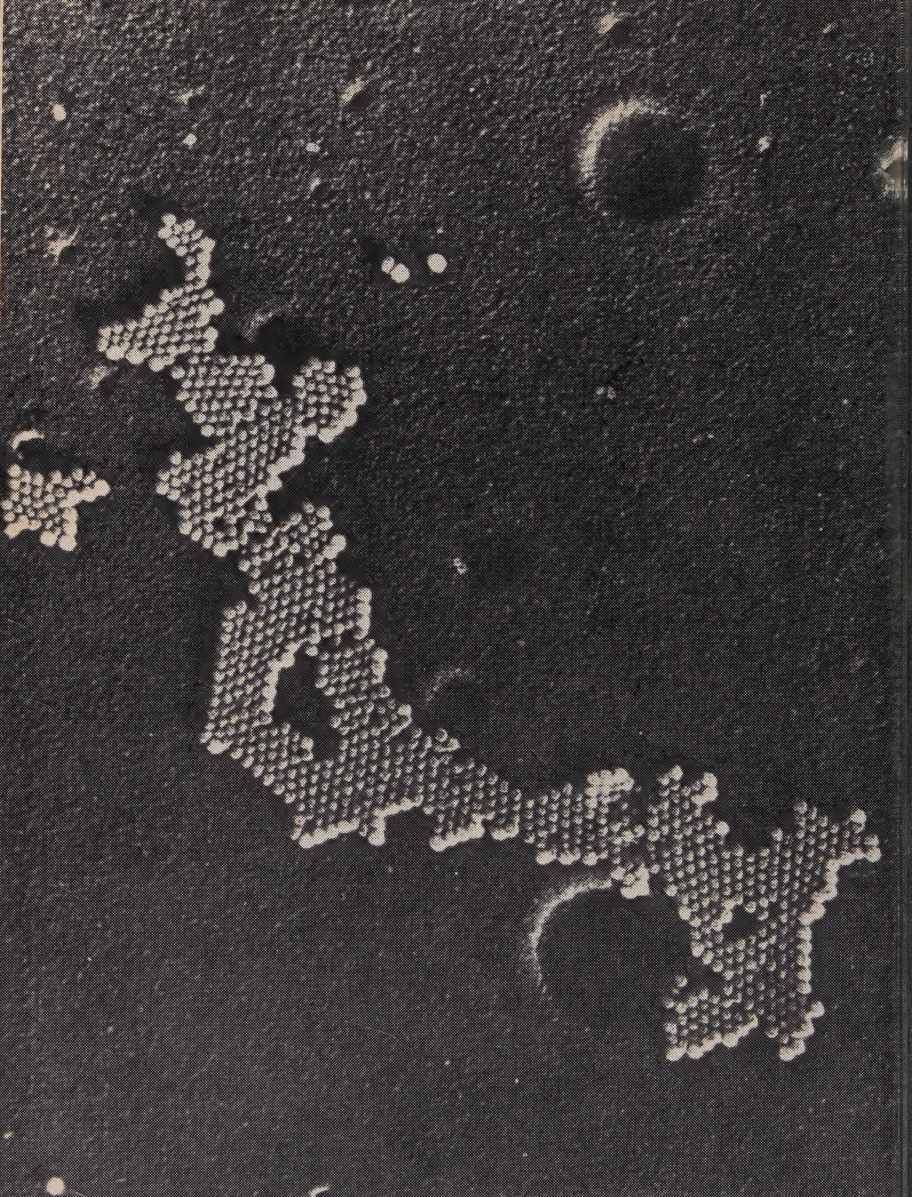
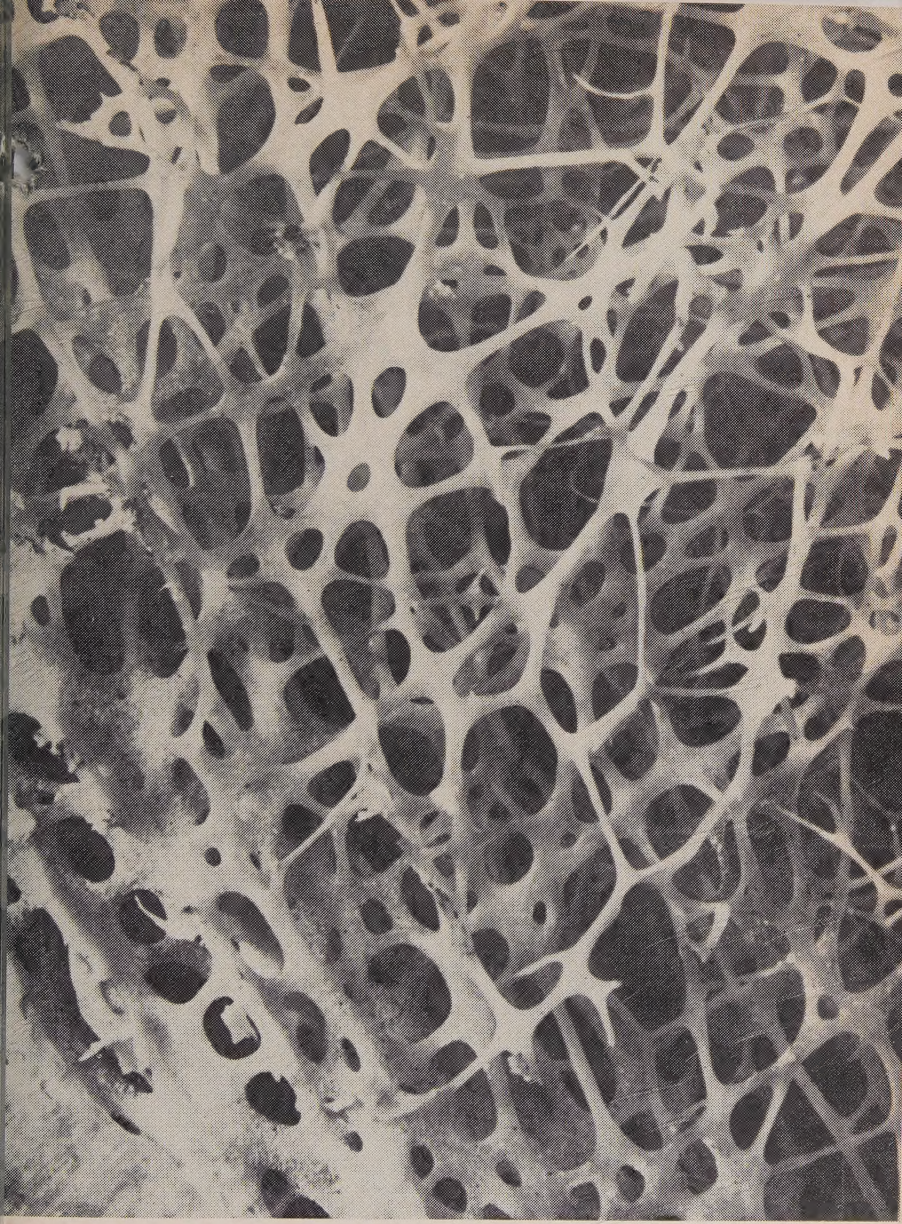
All photos pages 2 thru 9 from **What Science Knows About Life** by Dr. Heinz Woltereck, published by Association Press, New York, and used with permission.

All living creatures on this earth are shaped by the a
ties of the cells within them, such as in this microscopic v
(above) of the chromosomes and cell division of the on
Thus, to understand the origin and process of the cell i
understand the origin and process of life itself.

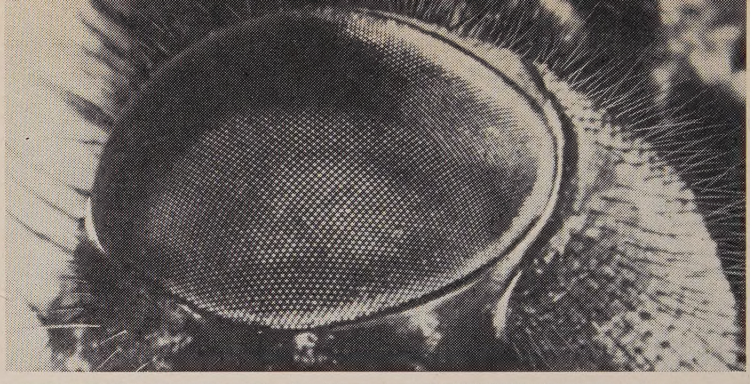
y before hatching, a chick fills the egg so completely that there is no eft. The uniqueness of all life is the capacity for its materials to organize prescribed manner. How did this prescribed pattern first develop? What s cause it to be the same time after time? The answers to these questions elp mankind control disease, birth defects, and his life span.

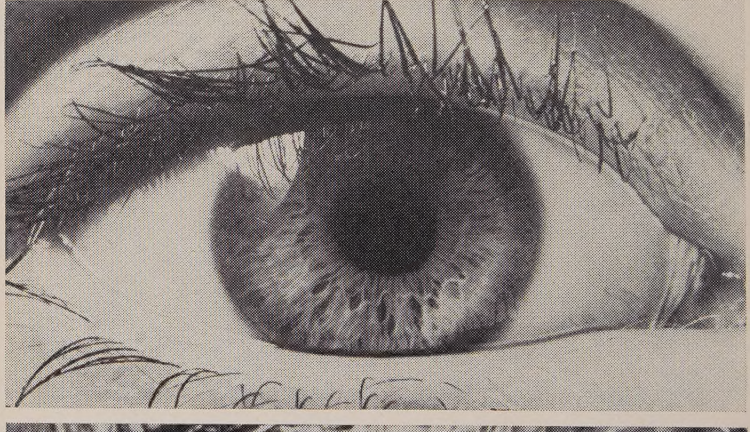


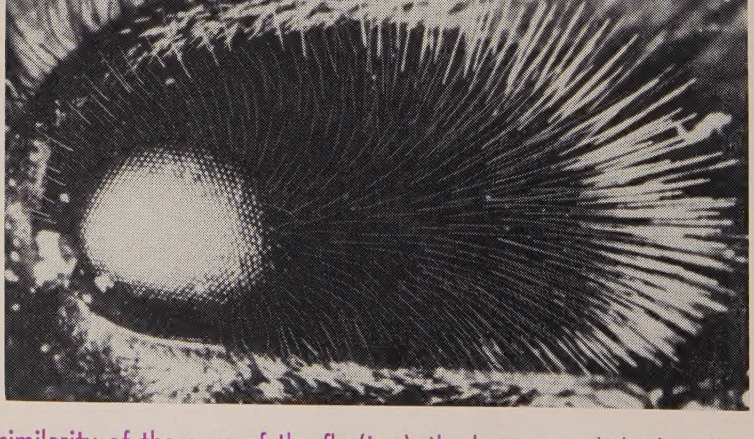
Among the most dangerous foes of all living things are the tiny disease
known as viruses. They cannot be seen or photographed except with an
microscope. Pictured above is the virus that causes poliomyelitis. All
engaged in a mighty tension between its weaknesses and transitoriness
one hand and the urge toward eternity and survival on the other.



study of man's bone construction (20 times enlarged) is seen the girder-
n which the trabeculae are so arranged that they follow the lines of thrust
raction. By a combination of connective tissue and calcium, the human
becomes both rigid and elastic. And for those millions of species of in-
nature devised a much lighter scaffolding for greatest mobility.

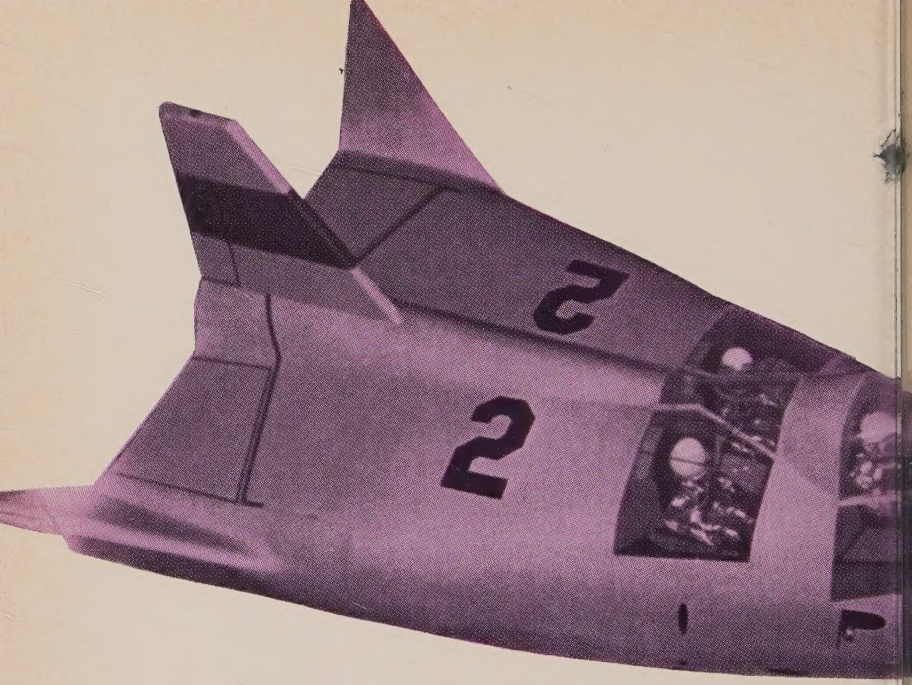






The similarity of the eyes of the fly (top), the human, and the bee (below) well support the theory of "convergence," which is the tendency of s evolving along highly diverse routes, to converge toward life forms that, be of certain basic laws, resemble one another. Thus, one physicist theorizes, ligence will sooner or later appear on any planet where there is life.

the moon is too small to have enough gravitational pull to maintain an sphere, the astronauts will find neither water nor air. But wherever there is net whose environment is similar to that of the earth, biochemists believe ife will inevitably arise. One noted astronomer estimates that at least 100 n planets are inhabited.



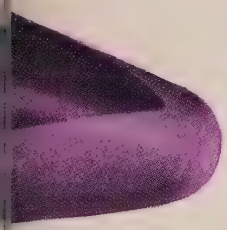
predicting the future is an

Ray Bradbury, the nation's top science-fi

"The best way to become a writer is to get into the habit of writing says the nation's No. 1 science-fiction writer, Ray Bradbury. "Write least 1000 words a day for ten years. Tackle a short story each week or equivalent in essay, play or novel form. Habit is everything. And so ma writing such a part of your life that you won't want to stray from the da discipline and desire of writing." Working from 9 a. m. to 5 p. m. ea day has become a habit for Mr. Bradbury. And a successful one. He beg writing at the age of 12, sold his first story at 19, and since then has pu lished 300 short stories, and 14 books of short stories, plays, and novels. does an occasional TV script for Alfred Hitchcock. And now he's writi the screenplay for his own novel, *The Martian Chronicles*, while anoth *Fahrenheit 451*, is being filmed by French director Francois Truffant.

But just putting words down on a page does not make a writer. Ma things are involved, but certainly included are imagination and a gen interest in the world in which you live. Mr. Bradbury is convinced

neuvering for an imaginary ren-
vous in space, a re-supply vehicle
proaches a distant orbiting space
tory in an exhibit at the Hall
ence at the N.Y. World's Fair.



old as Plato

ler, is interviewed by Kitte Turmell

magination sprouts, if you make the most of the chances to learn about nd enjoy all the good things around you. In his home in California, where here are four daughters—ranging in age from 15 to 13 to 7 to 6, there's huge basement. Play and hobby equipment there includes paints, clay. ecords, books. Everyone does what suits their interests of the moment. reativity is never discouraged. When one wants to do something on his wn, with no kibitzers, all step aside. When an audience is wanted, the mily is ready to admire, or at least watch quietly, with no discouraging omments. Mr. Bradbury believes that home is the place where creativity hould be allowed to develop without restraint.

As we fired our questions, Mr. Bradbury responded with a tiger-speed of lk and thought that belied his round tranquil face. And his informal ttire was as down-to-earth as his ideas about how to write science-fiction ▶ nd why it's worthwhile as a challenge and a guide in today's troubled rld.

The feasibility of jet propulsion was already considered by this cartoonist in 1860.

How old is the art of writing science-fiction—or the predicti through stories of what man will do in the future? "This goes back Plato's *Republic,* which is a philosophizing of man, trying to imagine a p fect society. *That* is science-fiction, authored by anyone who tries to imagi the future in any form—in politics, in ethics, in ways of life. Science-fict moved up through the centuries and came into full bloom in the 19th Ce tury with Jules Verne.

Have science-fiction stories actually opened new avenues of sci tific discovery for the real scientists? "Yes, as far as I know Ju Verne inspired a 12-year-old boy, after he read *20,000 Leagues Under t Sea,* to say 'I will grow up and invent a submarine'—and he did. Wh Richard Byrd was taking off to explore the North Pole, he told reporte 'Jules Verne leads me.'"

Are science-fiction stories growing or decreasing in popularit Why? "Increasing. Why? Because we're in the middle of the Space A so it's natural for everyone to be curious. This is the trend in magazines general interest. There are more novels in print and more special selecti in libraries for science-fiction than ever before in history. Twenty-five ye ago there was hardly a handful of such books in print; now there are hu dreds, in hard-cover-books as well as countless in paper-backs."

Has a science-fiction piece ever been written in which the chara ters advance in personal morality at the same tremendous speed they do in technology and knowledge? "There are plenty of exampl Jules Verne wrote mostly of men equal to technology. Nemo was a madm but a moral force in a way to express Jules Verne's attitude: 'Look, hum being, your brain can do things and create; you can be better than you and I trust you will be.' He challenges you in *Around the World in 80 D*

All prints from Bettmann Arch

face up to a challenge in time and machinery and come out on top. In *sterious Island*, as the modern Robinson Crusoe, you must save yourself by using brains, hands, and machine. When you finish such books you feel broud of the human race.

"Like nine out of ten science-fiction writers, I am, in a sense, a moralist, realizing that with each new machine we create, new laws must control its direction. Machines are amoral but have power that can inspire man to unacy, idiocy or evil. Morality must induce man not to use maniac power, ngineered in a car with mechanical and human ingenuity, to crash up in estruction. Buildings must be designed to produce happy human beings, ot unhappy hearts. In order to stay sane we cannot be all reason nor all assion. Arts can help us control our jungle needs. This is the stuff of which ood science-fiction is made."

Who's responsible for safeguarding man against irresponsible nd immoral use of man's scientific achievements? "Each of us. It oes back to the old song 'Brighten Up the Corner Where You Are.' If each erson in the world lifted one spade of sand, we could move the Sahara n a few weeks. The fault in many countries is that if an individual picks up spade and says: 'Hey, which way to the desert?' we criticize the way he olds the spade and the way he talks until finally he gives up in disgust.

"Each of us should write more letters to people in power—we put this off lthough we know such letters are read and are an influence. This is artially a product of our specialization—with the scientist just being a cientist, the politician just being a politician, the writer just being a writer. n the best of all possible worlds, each person would take different roles very week, as a scientist, as a politician, as a philosopher, etc., just as a enaissance for the man whose education is well-rounded. All you have to o to see this need is to spend one hour at a party with a person so special-ed in his profession that he thinks and talks of nothing else—this over-spe-ialization is a shame and a real problem."

Has religion ever played a part in any of your stories? "Oh, yes! have depicted Christ in another world, priests on Mars, the difference in ttitudes between Italian and Irish clergymen, to name a few. Although I m not a church-goer, that does not mean that I am not religious. In fact, just finished an article being published in newspapers throughout the world alled 'God On Tomorrow,' about the new understanding of God that must e created for the Space Age. For a Christmas cantata for the University f Southern California, I dealt with Christ, God, space travel, rocket ships.

"My thoughts about all this are not fresh or new—they have been around or centuries. I feel that in the Space Age each person must look on himself s a god, that is, a living part of the universe, a moving intelligence. If God xists, he lives in us. There are two parts to the universe—the dead and neral part and the living part which includes all animal life. Why should

These moon inhabitants were imagined by an artist in 1902.

it be so bad to think we might turn out to be a god? By that I don't me man created self. I believe God extended himself by creating in us ey nose, ears—so that we are the eyes of God—a proud thing and I am excit by this concept.

"To me, space exploration is a religious, not a political moveme whereby we will save life and live forever. If we put ourselves on oth worlds perhaps we can be immortal at last. This concept is hard to e plain, but I believe it sincerely and have been asked to speak about it— groups including one at U.C.L.A. recently, on the platform with theologia including priests and rabbis."

Just how much do the trends and attitudes and events of our tim influence a writer in what he writes? "I think all these things affect writers completely—as they always have. We are all children of our ov times, of lives given to us by our environment that supply the grist f science-fiction. The writer, surrounded by machines, seeing what they a doing, would feel like a fool if he didn't make some sort of comment."

Why do you write? Is this an outlet for you or what? "It's ever thing, a great joy, it makes me feel good, everything we do must be joyf and fun. When doing what you are doing quits being fun, you'd better g out of that field, fast. You're only alive once!"

In what way, if any, does writing for films differ from writing sho stories and books? "To write for films is like writing poetry; they a closely allied. You try to make writing for films visual—unlike the story which you try to put everything on the written page. For a film you n

try to write as if for a silent picture that doesn't talk at all. In a good film speech shouldn't show. The most memorable scenes are those in which a word is spoken."

What about writing for TV? "I only do it once a year, for Alfred Hitchcock. It is hard work, on dreadful terms, because you don't have enough time to do what you feel is really good work—to think and improve —and after all, time is the essence of everything."

When you were in your teens, were you influenced to be a writer by someone you knew? "Yes, by Aunt Neva who brought me up in a let's pretend world full of masks and stages and puppets. I read fairy tales—and Poe—at age seven. I explored fabulous, mythological countries from which I have never quite emerged. For Hallowe'en I dressed as a witch or monster to scarify. I read Buck Rogers at age 8 and saved every strip—for 12 years—I still have them. Then came Tarzan, Verne, H. G. Wells, Tom Swift, and Stevenson."

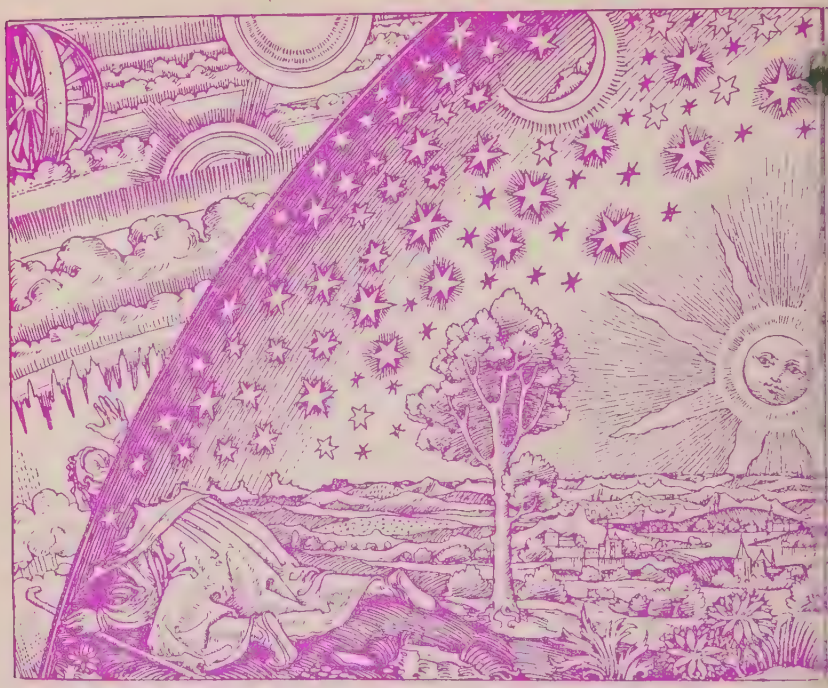
What about those people who write just for the sake of earning money? "I'm tired and sick of hearing talk about money for its own sake, instead of what it really represents. Just what does money represent to you? If you don't know, find out! Ask yourself! Think of the actions of the people of the world—things done for money and things not done for money. In themselves, are the things done good or bad? End up looking at what you are doing—is it just for money or because you love doing it? It's a dreadful thing to see people of all ages giving up what they love doing—for money or any other reason—and doing what they hate instead, just to make a living. Later in life, they will wind up wondering why they hate to be alive!"

How do you know when you aren't writing as well as you can? And where does your imagination fit into all of this? "I really believe that you can feel the swamp hair growing inside yourself as a result of doing work that is less than good, or being around people you detest, for ulterior reasons. Most of us feel these things but haven't the courage—I guess that's the word for it, Kitte—to break and run, soon as we feel sick.

"Sickness at first comes from whatever imagination one has that is being locked away and neglected. In the old days, when people went mad there weren't many asylums. If one had enough money, he kept the person in a locked room, in bed, or in a tower and pretended he didn't exist.

"The situation is the same today, in regard to people's imaginations and creativity. They lock away their heritage, their trousseau (with which they could be wed to the arts) and go around pretending imagination doesn't exist. So they put on masks, trying to please everyone, and end up by pleasing no one."

If a young person has written a science-fiction story, by what standards can he judge whether or not it is a good one? "He shouldn't try. The best thing is to write lots of stories. After you write 100 you can tell



which are good and which are not. Nobody else can tell you. We have
take words from friends, occasionally, about whether what we write is goo
bad, or mediocre, but we don't believe them, really. We must teach o
selves, finally; then let time pass judgment while we keep on working har

How can a writer prepare to be a good science-fiction writer? "
learning a lot about a variety of things in many fields—art, music, scien
by reading the good, the bad, the mediocre and learning to know t
difference; to prepare to do his most to be excellent in whatever field
chooses—then he's ready to write science-fiction if that's what he m
wants to do.

"Apply your imagination. Whatever you have that is individual give
the world from your diversified information and your mind—no one e
will have exactly the same thoughts. Be yourself out of all the people w
are around you. Then they won't pass you by.

"The fact is that sometimes when we finally dare to speak our foolishn
it turns out to be wisdom. We see small crowds collecting in the ma

ligious, not a political movement

The 16th century artist who pictured man looking into outer space was perhaps very daring for his day. Yet his woodcut was based on his own knowledge and enriched by his artistic imagination. Today Ray Bradbury with his typewriter is a leader among writers and artists who imagine the world of tomorrow. His science-fiction stories have been translated into 18 languages and his work appears in 30 textbooks used in grade schools, high schools and colleges across the nation. Currently a ten-million-dollar production of his novel, **The Martian Chronicles**, is being readied for the cameras for shooting later this year. Mr. Bradbury said recently in **Show** magazine: "Since I strongly believe that this is the greatest age in the history of man to be alive in, I also believe that science-fiction is the greatest literary form available to express the demands of our age."

place and we suddenly decided we have a hungry audience to satisfy.

"So, while we can't go looking and expect to find an audience waiting for us, because no such audience exists, we can accomplish much by being individual, doing things that may catch the eye. If you interest one out of 999 people, there will be your audience—perhaps for a lifetime. Because you will be speaking in your secret mood to them and they will respond without quite knowing why to the problems of your existence which, without even trying or quite knowing why, they find is their own problem, magnified through your imagination and creativity.

"You learn a lot by reading and writing many things, that may be good, bad, or mediocre. You may even love a few things in this world that are bad—like Fu Manchu—I do! So don't let snobs put you down, if your tastes are diverse. Explore ideas that are both shallow and deep, wide and narrow. Cultivate good catholic tastes. Give your subconscious much to draw from, and the emotional means to make hidden decisions for you while you are at work, drawing from your background of diverse experiences." ▼


INSIDE
AN
ATOMIC
LAB . . .

The National Youth Conference on the Atom brought together in Chicago 200 gifted high school students and 200 teachers to listen to top scientists, to discuss issues and to tour the Argonne National Laboratory and Chicago's Museum of Science and Industry.

Top teen students are in big demand, because a technological society needs imaginative and alert minds that are trained and equipped to face the growing problems of tomorrow. Thus, the annual National Youth Conference on the Atom strives to stimulate interest in science among high school youth. Celebrating its sixth anniversary this past November, the conference aims to present to some of the nation's ablest high school science students and teachers an authoritative and inspiring picture of the promise of the peaceful atom in its various applications, and to help advance interest in the study of science in the United States. The welcoming message to the delegates said:

"The Youth Conference is in one sense your reward for excellence in scientific achievement. You are here because your teachers and educators believe you deserve to be. In a large sense, though, the conference provides national recognition for academic and scientific excellence in the hope that such recognition will stimulate other people to strive for and achieve such excellence."

For three days in Chicago the delegates heard world-renown speakers and sought to deal with some of the tough scientific problems and realities with which the world is faced today. They listened to speeches on genetics, physics, the atom as a source of electric power. radiation, transuranium elements, and the atom in space.

President Johnson sent a message to the conference which contained this direct challenge: "Twenty years of life in the atomic age have demonstrated to us both the devastating power as well as the high benefits of this extraordinary source of energy. No small share of the responsibility for exercising this power wisely and widening its benefits will rest upon your shoulders. I know you will meet this responsibility in a manner that does credit to yourself, your nation, and to all mankind."

Attending this conference was Jim Starr, a member of the United Church of Christ from Clinton, Iowa. In the following pages Jim shares with the readers of YOUTH magazine a little about the conference.

tes tour Argonne National Laboratory

Dr. Glenn T. Seaborg and teens discuss atomic exhibit

From my hometown of Clinton, there were two of us who were dele gates to the conference—Dan Petersen, a boy from St. Mary's Hig School, and myself. The teachers in our schools made the selectio Also in my group were eight other boys and a teacher from areas i northwestern Iowa and southern Minnesota which are served by Inte state Power Company, one of a number of local agencies sponsorin the national conference.

One of the things I was most looking forward to was a trip to th Argonne National Laboratory, one of the three largest centers operate by the U.S. Atomic Energy Commission, and to the Museum of Scienc and Industry. Both of these places should certainly hold somethin interesting for anyone visiting them. The Museum of Science and In dustry covers a great variety of subjects, but most interesting to me wa the physics exhibit. It demonstrates with working models the mo important principles of the science. The museum is much too large t visit in a day, and completely impossible to see in the two hours whic I had. Since I live only about 150 miles from Chicago, I have bee fortunate enough to visit the Museum in the past, but many of th students who came from the far corners of the country may have bee disappointed that they could not see more. One suggestion I wou make for future conferences is to allow more time for a visit to th Museum.

HOW DOES YOUR BRAIN RECORD IDEAS?

You are putting information into your nervous system right now. How are you putting it there? Nobody knows. You have trillions of nerve cells in your brain and they communicate in a very complicated way. When you put information in, when you hear talk, as you read, and as you think, that information is recorded in your brain. How is it recorded? We have no idea. Some people think it is maybe a molecular code. It is more likely a pattern of communication that is established in these nerve cells of the central nervous system. We don't know. But we do know that that is tremendously important and we do know that our nervous systems are constructed according to the instructions of DNA and that our nervous system is superior to those of all other species on earth, in the sense that it can record tremendous amounts of information, and that you can get it back at will. But how is it put in the brain? To biologists, this seems to be the number one question to be answered: How is the information stored in the nervous system, how is it we can do the remarkable things that we can do with that nervous system? A lot of it is built in. A bird makes a nest without anybody teaching it to build a nest. That is built in, according to DNA instruction. A bird can migrate from near the North Pole to a small island in the southern hemisphere, without making a mistake. It does this by following the constellations of the stars. Imprinted in its brain somehow is a picture of the stars. It looks up at the stars and knows where to go. How is this done? Nobody knows. That will be something for you to describe.

—excerpts from a speech by Dr. George Wells Beadle, president of The University of Chicago.

Of about a dozen speeches which were given, there were two which I thought especially good. One was the keynote address by Dr. George Wells Beadle, who spoke on recent developments in genetics. He explained many of the more complicated theories in such a way that they were easy to understand, pointing out the importance of genetics in our lives today.

The other speech which I enjoyed greatly was given after the conference dinner by Dr. Glenn T. Seaborg, chairman of the Atomic Energy Commission. His discussion of the transuranium elements, those which have atomic numbers higher than that of uranium, seemed to me to be far more interesting than the discussions found in books on the subject. This is hardly illogical, however, for he is credited with the discovery of more than one of these elements, and should be able to give a far more exciting account of their properties than many other scientists would. There were several other speeches which I found very enjoyable and educational, but I believe that these two to be the most outstanding.

Considering that most high school students in this country realize that there are great scientists in the United States, probably the best in the world, and that they probably know that many of their fellow students are interested in science, I would say that the most important thing they ought to know is that the annual National Youth Conference on the Atom is open to them and that it is a wonderful opportunity. Appar-

PLUS OR MINUS ONE SECOND IN 30,000 YEARS

We hope that our maser oscillator will be a very accurate clock. How do masers t in with time keeping? We measure time by observing some well-regulated periodic oc currence and then we use this period to measure other time intervals. For example, w call the time interval it takes the earth to orbit the sun a year and we then measure t life span of a person in terms of this interval. In a pendulum clock we use the perio the pendulum as a standard to drive the hands of the clock. Now you know that time a very important factor in modern science, and in other affairs of men. Unfortunate we cannot measure time with arbitrary accuracy. There is always a discrepancy in me suring a period, and in fact there may be a variation in the period itself. For examp the rod of the pendulum stretches and vibrates causing an uncertainty in the ti measurements. Electro-magnetic radiation is characterized by a frequency or a perio variation of the electro-magnetic field. The atoms emit resonance radiation. Of all t periodic motions available to man, the periodicity of resonance radiation from atom the most stable one. It is least influenced by variation in environment and other turbances. Maser action further stabilizes the resonance output of the atomic system. a maser oscillator is potentially a very accurate clock.

—excerpts from a speech by Dr. Pe Davidovits, research physicist at Columbia University and designe of the "rubidium 87" clock

ently it is not necessary to be a constant science student and very ou standing, for I did not take a science course last year, nor have I ev won any recognition in science fairs or contests. The program shou certainly be encouraged and publicized in those schools where delega are chosen.

I did not find that anything said at the conference came in confli with my Christian conscience. I do not believe that scientific fact ne ever come in conflict with Christianity. Many people would certain disagree with my beliefs, but I contend that although many of t miracles mentioned in the Bible most certainly cannot be explained i present scientific knowledge, no scientific facts at present would sugge that God could not cause these miracles to occur.

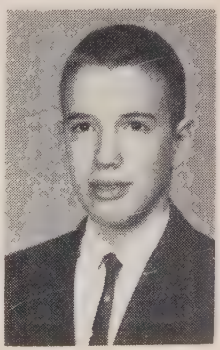
My own science projects, in general, have been rather simple in natu and not too successful in competition. I built an analog computer whic plays tic-tac-toe against a human opponent. My computer, which operated by means of a series of multiple circuit switches, has a perfe no loss record at tic-tac-toe, except for one loss due to a short circu at a crucial moment. Although it could have worked much better by t use of relays, I made it without relays because of the fact that rela are rather expensive and my finances were rather limited. The machi ran well without relays, however, but was a little more complicate The same machine could easily be built by anyone having the litt perseverance necessary to analyze tic-tac-toe, which is actually a rath simple game. The computer was not expensive to build, but did ta some time to wire.

Another project which I helped to build was done for the junior high school which I attended. My science teacher, with the help of about three of his students, built an oscilloscope so that he would not have to show one each time his students were studying sound. I was one of the three students.

A third project, dealing with mathematical relations in astronomy, was encouraged by the same science teacher, which renewed my interest in the idea that there may be some relation between characteristics of the various planets and the number of moons they have, which would indicate the means by which they were formed. Needless to say, I proved nothing, but did get a lot of enjoyment out of the project.

There are too many important and challenging areas of science to select just one above all else. Certainly some of the most important, however, are those concerning our great increase in population and our decrease in raw materials. Solving these problems will have the greatest effect on our civilization and its future. I would put the maintenance of world peace and understanding near the bottom of the list of important aspects of science, for such efforts for peace should come from the heart of man, not from the mind. The scientist has no personal responsibility for the future, since science should be the servant of humanity, and, therefore, the responsibility of all mankind. Religion should be the guide for human responsibility, but kept separate from science. I find no trouble to believe both, but if I tried to mix them, the conflict would undoubtedly be irrepressible. As for the scientist and the government, both are servants of humanity and therefore should be on an equal level. Neither should be allowed to supersede the other.

In conclusion, I wish, as everyone else does, to accomplish that which will most benefit the common good of man, for this is the only way in which the purpose of a human life may be fulfilled. —JIM STARR



JAMES STARR, CLINTON, IOWA. AGE 15 / Jim Starr, delegate to the 1964 National Youth Conference on the Atom, is a junior at Clinton High School, and a member of the United Church of Christ. His work building a computer which plays tic-tac-toe against a human opponent helped him to get the invitation to the conference. He has also built an oscilloscope, and worked on a project involving mathematical relations in astronomy. Although Jim's main interest is science, he sings in the school choir, plays cornet in the band, and is on the debate team. In answer to the question what are the most important things facing us as individuals, he replies, "We must be careful to form our own opinions and not allow others to completely guide our thought." As to his future Jim says, "I hope to be able to do some type of work which will benefit mankind."

"It is the year 2000 A.D. We are now entering the 21st century. The world looks forward to a hundred years devoted to improving the spiritual quality of human life after passing through a rather grim period around 1984." Thus began a recent prediction of the future by an expert in urban studies, Dr. Robert B. Mitchell. He continues his projection . . .

"Yesterday evening when I landed from Peking, my wife met me at the East Coast Central Airdome near Princeton. We quickly attached my comfortably-appointed air capsule to our vertical take-off 'air tractor' and were soon greeting the children in our home in the hills overlooking the Delaware River. My wife explained that she had finished preparing the dinner by radiovision while waiting for me at Princeton. Our new home, which enjoys solar power heating and air conditioning, is one of many which have been built in the mountains since the construction of the automatic highway by which I can reach my office from my own front door in 29 minutes and 53 seconds.

"I had been away from home two days, having gone to Peking to confer with one of my research colleagues. While there I took advantage of the opportunity to enter their central hospital overnight and exchange my heart, which I had used for over five years, for a reconditioned model somewhat larger and more powerful, originally grown in the province of Sinkiang. I really believe that hearts from Sinkiang are the best in the world for all around performance. And they seem the best adapted to my personal pattern of neuroses which I have cultivated carefully to give me the drive I need to complete my research studies. Since the economic compulsion to earn a living was removed from mankind this year, we must carefully adjust our personalities to avoid that dreaded stable equilibrium."

The city of tomorrow as envisioned in the General Motors Futurama at the New York World's Fair

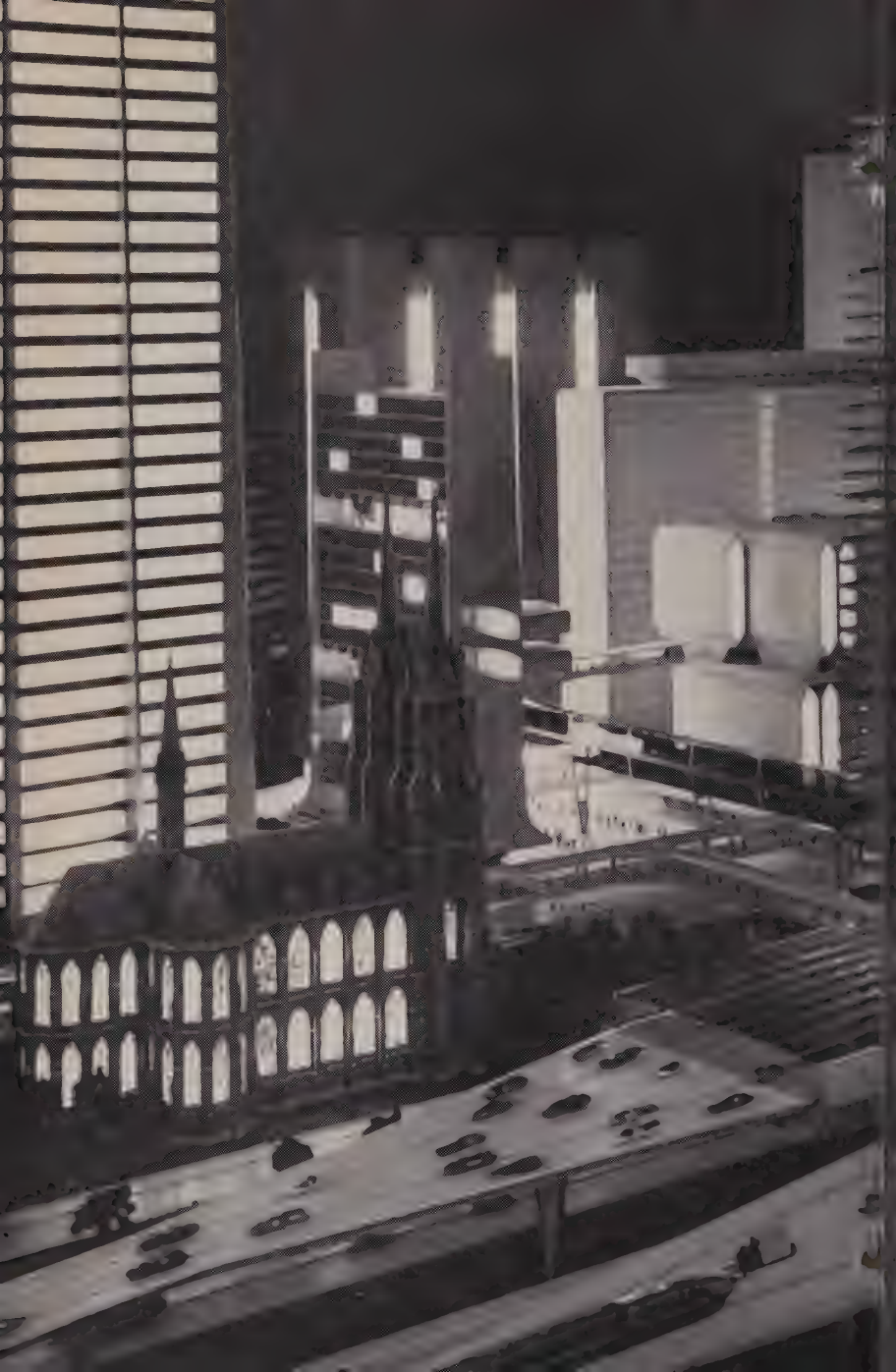
Will you live to be 100 ?

Biologists believe that man should live much longer. "Most living creatures reach six times the age represented by their maturation period," observes Dr. Heinz Woltereck in *What Science Knows About Life* (Association Press). "A human being normally takes about 20 years to mature, hence his maximal span should be 120." Modern man has done much to prolong his life span. Dates on tombs in the pre-Christian era show that most deaths occurred between the ages of 20 and 30. Today in a culture where medicine and hygiene have helped to control diseases and infection, the life expectancy has risen to more than 65 years. Yet in countries like India where the birth rate is vast and the practice of modern hygiene is limited, the average Indian girl has the prospect of 27 years of life and an Indian boy may reach the age of 33. But even where man has conquered disease and made work easier for himself, he must avoid the danger of non-use of his body, especially his brain and his tools for locomotion—the legs. Nothing will preserve the resilience of his body better than physical exercise, regular walks in the fresh air, and wisdom in the food he eats and drinks. And not only does the brain age quicker, but even degenerates, when it is not given enough to do. Our early life is simply preparing us for a second stage—those decades of intellectual maturity and a fulfillment of the highest specifically human tasks. The most productive years, in terms of doctors and lawyers, poets and composers, scientists and statesmen, come between 41 and 58. Yet so few men in human history have lived to enjoy this second phase of their lives. Dr. Woltereck summarizes: "If science succeeds in bringing more people to a great age with their physical and intellectual health preserved, there is every prospect that at least a large number of the species, *Homo Sapiens*, will not only be 'knowledgeable' but also 'wise.'"

$$N = R^* f_p n_e f_l f_i f_c \bullet L$$

The above formula is considered by one group of scientists as the most exciting equation in existence, perhaps even *the* equation of existence. These reputable scientists are probing the possibilities of the existence of intelligent life on other planets within range of communication from our earth. This story is told with excitement and authority in a new book, *We Are Not Alone*, by Walter Sullivan (McGraw-Hill). N in the formula represents the number of civilizations in our own Milky Way galaxy currently capable of communicating with other solar systems. The symbols to the right—the rate at which stars were being formed in our galaxy when the solar system was born; the fraction of stars with planets; the number of planets in each solar system with an environment suitable for life; the fraction of planets on which life actually appears; the fraction of life-bearing planets on which intelligence emerges; and the fraction of intelligent societies that develop ability and desire to communicate with other worlds. The final factor—L—is the most critical. It represents the length of time in which each society and its technology desires to and is able to communicate with another planet. These scientists suggest that Phase L is either very short in time, perhaps even less than 1000 years, or very long, more than 100 million years. If the critical time is less than 1000 years, the earth may be near a unique moment in history—a brief span of time when it is capable and desiring of communicating with similar civilizations in our own galaxy. And if this moment passes, many scientists believe that it may not occur again for millions of years. Based on the formula, our failure to communicate during this critical moment may be caused by our failure to continue as a civilized society. Here, then, says Mr. Sullivan, is the key question: "Is there 'intelligent' life on earth?"

With food and other natural resources found in the sea, an underwater hotel is projected by GM's Futurama.



WHATEVER ELSE MAY BE MECHANICAL, VALUES ARE NOT. —Bertrand Russell

a student in high school, you cannot but wonder what all this talk about science has to do with you. As a modern young Christian, you probably wonder what religion and faith have to do with science and reason. And as a maturing human being on this tiny planet Earth, you wonder about the future of man and the world itself. All this wonder of yours is healthy and normal. It's when you stop wondering that you stop growing and stop living and stop being human, for man throughout history has continuously struggled from darkness toward light and when man ceases to wonder and to want to know, he is no longer man. And so, continue to wonder.

If yours is an honest search for truth, don't be afraid to doubt. Don't be satisfied with shallow answers. Read widely, observe all things around you, and probe deeply, for if you are not satisfied, the answer probably lacks meaning for others, too. But you must also recognize that science and religion do not have all the answers. And when there is no answer, both scientists and theologians accept much on faith, confident that the answers will eventually come, either through research or experience or new knowledge.

No man knows everything. If he claims he does, he deceives himself. But every man must make decisions based upon what he feels is correct information and right value judgments. This means being alert enough to know facts when you see them, being flexible enough to accept the possibilities of change, humble enough to admit error, and purposeful enough to sense a right direction, even when factual knowledge is lacking. How then does a person achieve that balance between certainty and uncertainty so as to move forward with enough confidence that he need not fear his every step? This is the chasm that faith leaps and that love bridges.

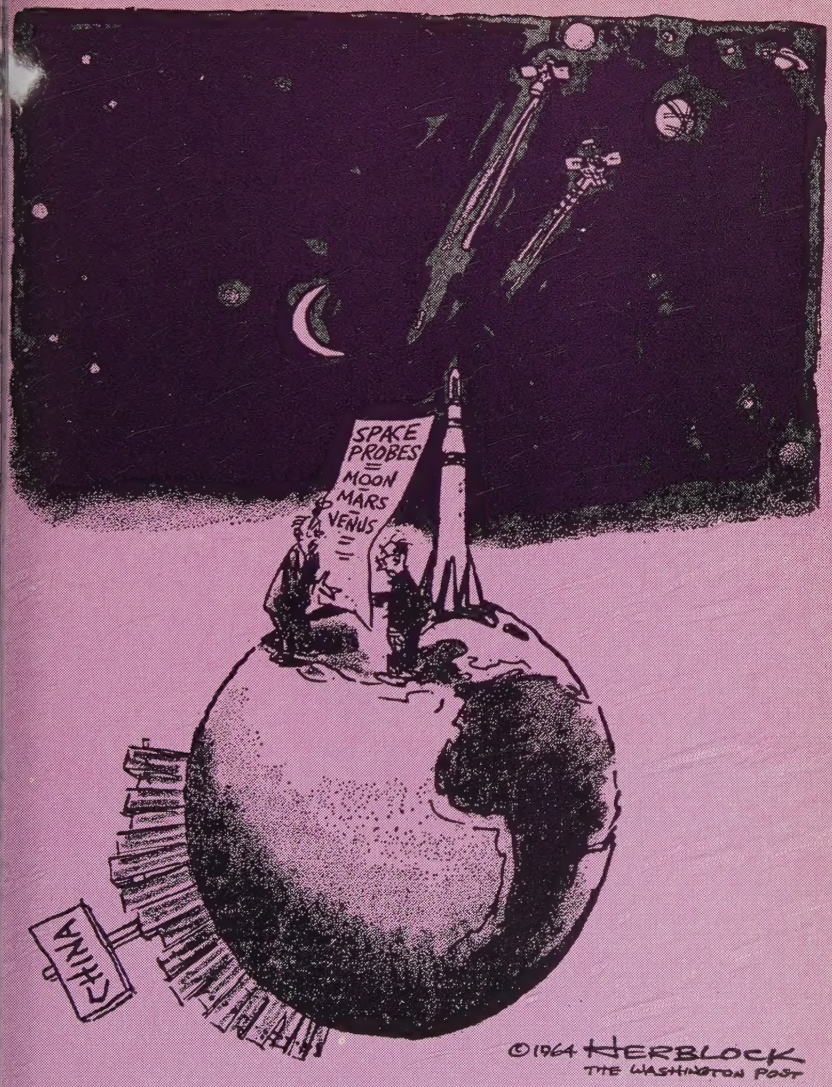
Life is not empty. It is full. It is so full in our age today that we don't know where to begin to make the most of it. And so we seek escape. You say, "*Why should I care about the future when the Bomb won't permit me a future?*" If that's your philosophy today, twenty years from now you'll deeply regret your immature lack of faith in that bigger Purpose that moves mankind and you'll wish that your gambling hunch had been more honest about the odds. Let's face it, those who use this excuse are looking for a reason to live it up now so that your foolishness won't seem so silly later on. So live today for a long tomorrow and then, if the world blows up tomorrow, you won't be blamed for it. . . . You say, "*We're only doing silly like adults do.*" But you know better; and perhaps they don't. ▶ the good example. . . . You say, "*But we're only young once!*" Right

city of tomorrow, will
urch be the same?

you are! So have the kind of fun now that adds to your growing up an doesn't taint your life forever. . . . You say, "*But no one understands us* The truth is you are the best understood generation in many a moon. B the problem is that the adult world won't let you grow up normally. Th want to accelerate your growth. You embarrass them with your advanc knowledge, which overshadows your immaturity, which blurs your perspe tive, which makes living in a fast-changing world more difficult for you an for everyone else. . . . You say, "*Religion is for the weak. The church irrelevant. It's a thing of the past.*" Do you judge a faith by those wh have failed to live in a commitment to it? Or are you, too, afraid to te your life against Christ's prime example? Age is often a virtue, especiall when it numbers the saints and sinners through the centuries who have pr served mankind for us today. . . . "*But,*" you say, "*I'm only one individua what can I do?*" Such a statement insults your own integrity. You w never achieve anything beyond the walls with which you enclose yourse Don't set your limits too small. Stretch your mind and your spirit an then you'll have more elbow room for individual action and growth.

Where do you find faith to undergird life in fast-changing, scie tific world? You do not find it solely by reading the Bible, nor simply b studying our Christian heritage, nor just by talking about faith, nor on by praying. It takes all of these, plus the dynamic ingredient that giv relevance to it all—involvement in the world around you. Find peop whose wisdom you respect; ask them questions. Find people you ca trust; confide in them. Find people who are happily married; observe th bonds that unite them. Find people who are jovial in old age; seek the jo that makes life good for them. Find people who give their all to ser their fellow man; what is their greatness? Find people who need unde standing; listen to them. Find people who are frightened; assure the that their fears are not justified. Find people who are odd; discover the uniqueness as a human being. Find people who cheat; show them hon Find people who are rejected; accept them into your crowd. Find peop who are fallen; lift them up. Find people you hate; pray for them an ask God to forgive you. Find the people you call your family; get know them as people.

And then someday you will begin to feel the roots of the faith takes to live in a fast-changing, scientific world. Then you will begin sense the quality of love which embraces not only man to man but man God. Then you will begin to know the reality and Lordship of the Word b come flesh and dwelling among us. Then what's right seems to fall in place a little easier. And no scientist can prepare a formula that defines a this. But if it's real, no scientist will deny the importance of what's happe ing to you, for "whatever else may be mechanical, values are not." ▼



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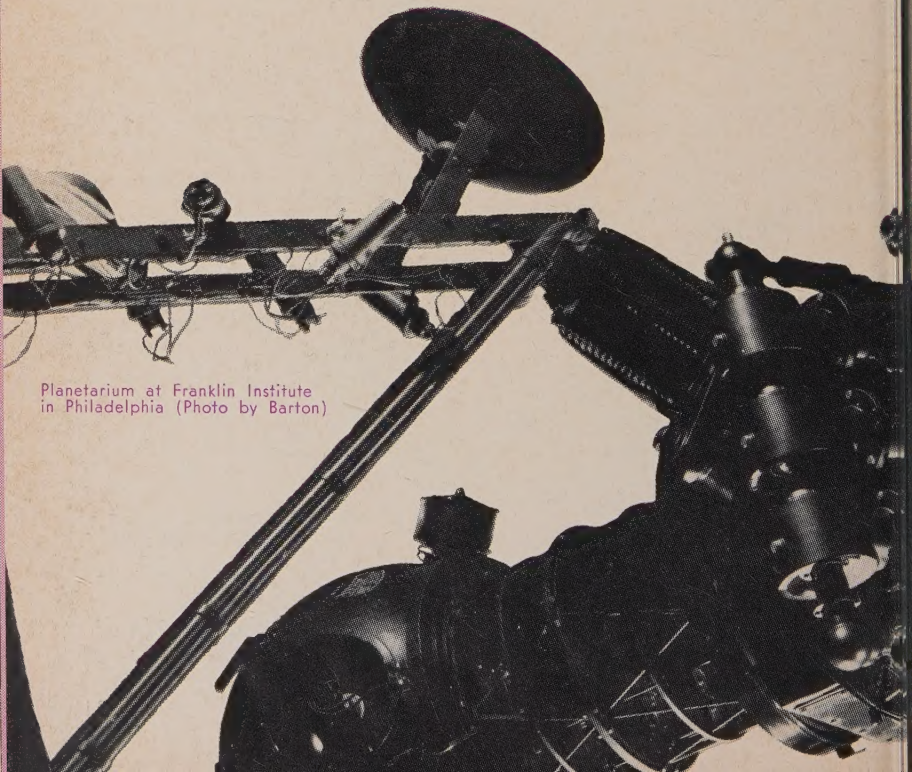
"And some day we may even establish contact with the other side of the world"

We are staggered by what we find
in our test tubes, our telescopes, our formulas—
all creation unfolds before our mind.
But our heart hurts.
The smallest atom threatens us.
The cure of disease is not shared.
The life of ease softens us.
Life on other planets has us scared.
Is our soul too small to meet the feats of our mind?
What is the Purpose of it all?
What are we missing?
O God, forgive us when we forget
that we are not the Creator, but the created ones;
that we are not the Maker, but the user;
that we are not the Father, but the child.
Creator God,
How did you intend for all this to be?
Giver of All Gifts,
Help us to know how to use what you have given us.
Beloved Father,
Teach us to live your way of love.



Planetarium at Franklin Institute
in Philadelphia (Photo by Barton)